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Format No: CP/TF/01

TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2019-08-30-108** **Date: 08-07-19**
Customer	:	Assistant Executive Engineer, Project Sub Division, BBMP, Bangalore.
Address	:	Project Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Footpath and Drains at Park HMT Layout in Ward No.09 Vidyaranyapura.
Agency	:	Executive Engineer, KRIDL, Bangalore.
Customer's Reference	:	EE(Project)Ynk Zone/WO/113/18-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	05-07-19
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 (Part 1,2 3,4,5, 6,11):1988 IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4 IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5 IS 4031 Part 3, Determination of Soundness, Clause 5,Clause 6 IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5 IS 4031 Part 11,DETERMINATION OF DENSITY , Clause 6
Date of test	:	06-07-19
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	Fineness by dry sieving (%)	2.87	–
2	Finess by Air permeablity method (m^2/kg,Min)	298.7	225m^2/kg, Min
3	Density (gm/cc)	3.12	–
4	Standard Consistency (%)	28.5%	Not specified
5	Initial Setting time	165 minutes	Not less than 30 minutes
6	Final Setting time	265 minutes	Not more than 600 minutes
7	Soundness (Le Chatelier's Method)	1.5mm	Not more than 10 mm

Note:

The results pertain to the samples received and tested.

All information furnished by Customer/Representative

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Quality Manager

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Format No: CP/TF/01

TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2019-08-30-108** **Date: 03-08-19**
Customer	:	Assistant Executive Engineer, Project Sub Division, BBMP, Bangalore.
Address	:	Project Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Footpath and Drains at Park HMT Layout in Ward No.09 Vidyaranyapura.
Agency	:	Executive Engineer, KRIDL, Bangalore.
Customer's Reference	:	EE(Project)Ynk Zone/WO/113/18-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	05-07-19
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 6, Determination of Compressive Strength, Clause 6
Date of test	:	06-07-19
Environmental Conditions during test	:	Temperature: 26˚C Humidity: 72%

Compressive Strength

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	3 Days	28.5N/mm^2	Not less than 27 N/mm^2
2	7 Days	39.0N/mm^2	Not less than 37 N/mm^2
3	28 Days	58.5N/mm^2	Not less than 53 N/mm^2

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2019-08-30-108** **Date: 08-07-19**
Customer	:	Assistant Executive Engineer, Project Sub Division, BBMP, Bangalore.
Address	:	Project Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Footpath and Drains at Park HMT Layout in Ward No.09 Vidyaranyapura.
Agency	:	Executive Engineer, KRIDL, Bangalore.
Customer's Reference	:	EE(Project)Ynk Zone/WO/113/18-19
Source of Sample	:	Sample supplied by Agency
Sample condition	:	Satisfactory
Date of Receipt	:	05-07-19
Sample Type	:	40mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	05-07-19

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:

Total weight taken : 15000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	80 mm	0	0	0.0	100	100
2	40 mm	246	246	1.6	98.4	90-100
3	20 mm	7875	8121	54.1	45.9	30-70
4	10 mm	3898	12019	80.1	19.9	10-35
5	4.75 mm	2587	14606	97.4	2.6	0-5
6	Pan	394	15000	100.0	0	---

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2019-08-30-108** **Date: 08-07-19**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	12.4	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	11.9	
3	Specific Gravity	2.64	_
4	Bulk Density(Loose) (Kg/l)	1.38	_
5	Bulk Density(Compacted) (Kg/l)	1.45	_
6	Water Absorption(%)	0.23	_

Note:

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2019-08-30-108** **Date: 08-07-19**
Customer	:	Assistant Executive Engineer, Project Sub Division, BBMP, Bangalore.
Address	:	Project Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Footpath and Drains at Park HMT Layout in Ward No.09 Vidyaranyapura.
Agency	:	Executive Engineer, KRIDL, Bangalore.
Customer Reference	:	EE(Project)Ynk Zone/WO/113/18-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	05-07-19
Sample Type/ Size	:	20mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	05-07-19

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:

Total weight taken : 5000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	40 mm	0	0	0	100	100
2	20 mm	298	298	6.0	94.0	90-100
3	10 mm	2644	2942	58.8	41.2	25-55
4	4.75 mm	1812	4754	95.1	4.9	0-10
5	Pan	246	5000	100	0	_

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2019-08-30-108** **Date: 08-07-19**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	8.9	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	11.4	
3	Specific Gravity	2.62	_
4	Bulk Density(Loose) (Kg/l)	1.42	_
5	Bulk Density(Compacted) (Kg/l)	1.48	_
6	Water Absorption(%)	0.35	_
7	Aggregate crushing Value(%)	24.8	Max 30% for Aggregates to be used in concrete for wearing Surface, In case Aggregate Crushing Value Exceeds 30% then the test for ten percent fines should be conducted for Aggregates to be used in concrete other than for wearing Surface.
8	Aggregate Impact Value(%)	25.1	30% for Aggregates to be used in concrete for wearing Surface, 45% for Aggregates to be used in concrete other than for wearing Surface.

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2019-08-30-108** **Date: 08-07-19**

Customer : Assistant Executive Engineer, Project Sub Division, BBMP, Bangalore.

Address : Project Sub Division, BBMP, Bangalore.

Project Name : Improvements to Footpath and Drains at Park HMT Layout in Ward No.09 Vidyaranyapura.

Agency : Executive Engineer, KRIDL, Bangalore.

Customer's Reference : EE(Project)Ynk Zone/WO/113/18-19

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 05-07-19

Sample Type : Fine Aggregate

Reference to BIS codes : IS 383 : 2016 (Specification for Coarse and fine Aggregates)
IS: 2386 :1963(Part - 1, 3) RA2012
IS 2386 Part 1: Particle Size and Shape
IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption

Date of test : 05-07-19

Total weight taken : 1000 grams

Sl.no	Sieve Size	Weight Retained (gms)	Cumulative Weight Retained (gms)	% Cumulative Weight Retained	% Passing	Requirement as per IS 383:2016			
						Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
1	10 mm	0	0	0.0	100.0	100	100	100	100
2	4.75 mm	27	27	2.7	97.3	90-100	90-100	90-100	95-100
3	2.36 mm	55	82	8.2	91.8	60-95	75-100	85-100	95-100
4	1.18 mm	239	321	32.1	67.9	30-70	55-90	75-100	90-100
5	600 micron	205	526	52.6	47.4	15-34	35-59	60-79	80-100
6	300 micron	203	729	72.9	27.1	5-20	8-30	12-40	15-50
7	150 micron	191	920	92.0	8.0	0-10	0-10	0-10	0-15
8	Pan	80	1000	100.0	0.0	---	---	---	---

Result :The tested Sample Conforms to Grading Zone II

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2019-08-30-108**

Date: 08-07-19

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS 383:2016
1	Water Absorption(%)	1.5	–
2	Specific Gravity	2.59	–
3	Material finer than 75 micron(%)	6.9	Uncrushed fine Aggregate Max 3%, Crushed Fine aggregate Max 15%, Mixed Fine aggregate Max 12%, Manufactured Fine aggregate Max 10%

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Format No: CP/TF/01

TEST REPORT ON PHYSICAL REQUIREMENTS OF SOLID CONCRETE BLOCKS

Lab ID	:	**CP-2019-08-30-108** **Date: 26-07-19**
Customer	:	Assistant Executive Engineer, Project Sub Division, BBMP, Bangalore.
Address	:	Project Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Footpath and Drains at Park HMT Layout in Ward No.09 Vidyaranyapura.
Agency	:	Executive Engineer, KRIDL, Bangalore.
Customer's Reference	:	EE(Project)Ynk Zone/WO/113/18-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	23-07-20219
Sample Type/Size	:	Solid concrete blocks size (400X200X200)mm
Reference to BIS codes	:	IS : 2185 (Part 1) : 2005(RA 2010) Concrete Masonry Specification Part 1:Hollow and Solid Concrete Blocks (Dimensions -Annex-B, Clause 9.2 and 10 , Block density Annex -C Clause 9.3 and10, Compressive strength Annex -D Clause 9.4 and 10, Water absorption Annex -E Clause 9.5 and 10)
Date of test	:	23-07-19

BLOCK DENSITY:

Sl. No.	Measurement of overall Dimensions of Individual Blocks			Overall Volume of the Block in Cubic Centimetres	Weight of Oven Dried Block in Kilograms to the nearest 10 Gram	Block Density in Kg/cum*10^6	Avg.Block Density in (Kg/cum)	As per IS 2185(Part 1) :2005 (RA 2010)
	Length	Breadth	Height					
	mm	mm	mm	(Cm^3)	Kg	Kg/m^3	Kg/m^3	
1	405	198	201	16118	31.585	1959.6	1982.3	Not less than 1800Kg/m^3
2	400	198	199	15761	31.792	2017.1		
3	403	203	199	16280	32.075	1970.2		

WATER ABSORPTION:

Sl. No.	Wet weight after water absorption	Dry weight (Oven dry)	Water Absorption	Avg.Water Absorption	As per IS 2185(Part 1):2005 (RA 2010)
	kg	kg	%	%	
1	33.91	32.25	4.89	4.25	Shall not be more than 10% by mass
2	33.57	32.14	4.28		
3	33.44	32.24	3.59		

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Lab ID : **CP-2019-08-30-108** **Date: 26-07-19**

DIMENSION ANALYSIS

Sl.no	Length mm	Breadth mm	Height mm	Requirement as per IS 2185(Part 1):2005
1	403	202	199	Length : ± 5mm Breadth : ± 3mm Height : ± 3mm
2	403	203	201	
3	399	201	203	
4	401	201	200	
5	402	201	200	
6	402	201	203	
7	400	202	202	
8	402	202	201	
9	403	201	201	
10	402	202	199	
11	401	202	200	
12	400	201	200	
13	402	201	200	
14	403	200	203	
15	404	201	203	
16	403	201	200	
17	401	200	199	
18	402	200	203	
19	403	201	199	
20	403	203	202	
Average of 20	**402**	**201**	**201**	

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Lab ID : **CP-2019-08-30-108** **Date: 26-07-19**

COMPRESSIVE STRENGTH:

Sl. No.	Size of solid block		Area	Failure Load	Compressive strength	Average Compressive strength
	Length	Breadth				
	mm	mm	(mm^2)	(KN)	N/mm^2	(N/mm^2)
1	403	202	81189	358.2	4.4	4.5
2	403	203	81838	389.9	4.8	
3	399	201	80391	371.0	4.6	
4	401	201	80687	370.0	4.6	
5	402	201	80579	374.4	4.6	
6	402	201	80683	354.0	4.4	
7	400	202	80630	365.4	4.5	
8	402	202	81145	357.8	4.4	

As per IS Requirements (Table 2, Clause 5.1, 5.2 and 9.4)

Compressive strength		
Grade	**Minimum average**	**Minimum Individual units.**
C (5.0)	5.00 N/mm^2	4.00 N/mm^2
C (4.0)	4.00 N/mm^2	3.20 N/mm^2

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Lab ID : **CP-2019-08-30-108** **Date: 26-07-19**

COMPRESSIVE STRENGTH:

Sl. No.	Size of solid block		Area	Failure Load	Compressive strength	Average Compressive strength
	Length	Breadth				
	mm	mm	(mm^2)	(KN)	N/mm^2	(N/mm^2)
1	402	103	41226	229.3	5.6	5.2
2	403	102	40950	200.3	4.9	
3	402	100	40140	206.8	5.2	
4	400	101	40291	215.9	5.4	
5	403	101	40856	229.2	5.6	
6	402	101	40558	222.9	5.5	
7	399	102	40727	181.2	4.4	
8	400	100	40130	192.7	4.8	

As per IS Requirements (Table 2, Clause 5.1, 5.2 and 9.4)

Compressive strength		
Grade	**Minimum average**	**Minimum Individual units.**
C (5.0)	5.00 N/mm^2	4.00 N/mm^2
C (4.0)	4.00 N/mm^2	3.20 N/mm^2

Note:
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TEST REPORT ON PHYSICAL REQUIREMENTS OF SOLID CONCRETE BLOCKS

Lab ID	:	**CP-2019-08-30-108** **Date: 26-07-19**
Customer	:	Assistant Executive Engineer, Project Sub Division, BBMP, Bangalore.
Address	:	Project Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Footpath and Drains at Park HMT Layout in Ward No.09 Vidyaranyapura.
Agency	:	Executive Engineer, KRIDL, Bangalore.
Customer's Reference	:	EE(Project)Ynk Zone/WO/113/18-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	23-07-19
Sample Type/Size	:	Solid concrete blocks size (400X100X200)mm
Reference to BIS codes	:	IS : 2185 (Part 1) : 2005(RA 2010) Concrete Masonry Specification Part 1:Hollow and Solid Concrete Blocks (Dimensions -Annex-B, Clause 9.2 and 10 , Block density Annex -C Clause 9.3 and10, Compressive strength Annex -D Clause 9.4 and 10, Water absorption Annex -E Clause 9.5 and 10)
Date of test	:	23-07-19

BLOCK DENSITY:

Sl. No.	Measurement of overall Dimensions of Individual Blocks			Overall Volume of the Block in Cubic Centimetres	Weight of Oven Dried Block in Kilograms to the nearest 10 Gram	Block Density in Kg/cum*10^6	Avg.Block Density in (Kg/cum)	As per IS 2185(Part 1) :2005 (RA 2010)
	Length	Breadth	Height					
	mm	mm	mm	(Cm^3)	Kg	Kg/m^3	Kg/m^3	
1	401	101	201	8141	31.336	3849.3	3953.1	Not less than 1800Kg/m^3
2	398	100	203	8079	30.550	3781.2		
3	405	98	200	7938	33.569	4228.9		

WATER ABSORPTION:

Sl. No.	Wet weight after water absorption	Dry weight (Oven dry)	Water Absorption	Avg.Water Absorption	As per IS 2185(Part 1):2005 (RA 2010)
	kg	kg	%	%	
1	31.91	30.35	4.89	4.25	Shall not be more than 10% by mass
2	31.57	30.22	4.28		
3	33.44	32.24	3.59		

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Bangalore

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Lab ID : **CP-2019-08-30-108** **Date: 26-07-19**

DIMENSION ANALYSIS

Sl.no	Length mm	Breadth mm	Height mm	Requirement as per IS 2185(Part 1):2005
1	402	103	199	Length : ± 5mm Breadth : ± 3mm Height : ± 3mm
2	403	102	200	
3	402	100	200	
4	400	101	203	
5	403	101	201	
6	402	101	199	
7	399	102	200	
8	400	100	200	
9	399	99	203	
10	401	100	199	
11	404	102	200	
12	399	101	203	
13	403	100	199	
14	403	103	202	
15	404	102	203	
16	400	103	200	
17	400	101	200	
18	399	101	202	
19	403	102	200	
20	400	99	199	
Average of 20	**401**	**101**	**201**	

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